Clean Coal Forum 2012

ECONOMIC CARBON CAPTURE
BASED ON HIGH FLAME TEMPERATURE
OXY-COMBUSTION APPROACH
在高温富氧燃烧技术基础上使CO2捕集经济利益化

JUPITER OXYGEN CORPORATION
JUPITER OXYGEN公司

Jupiter Oxygen Corporation
Jupiter　Oxygen公司

- **HIGH FLAME TEMPERATURE**
- **高火焰温度**

- **OXY-COMBUSTION**
- **氧气燃烧**

- **JUPITER OXYGEN HAS DEVELOPED AND PATENTED A HIGH FLAME TEMPERATURE OXY-COMBUSTION PROCESS FOR HEAT TRANSFER**
- **Jupiter Oxygen公司研发并拥有高火焰温度氧气燃烧和热传递工艺的专利**

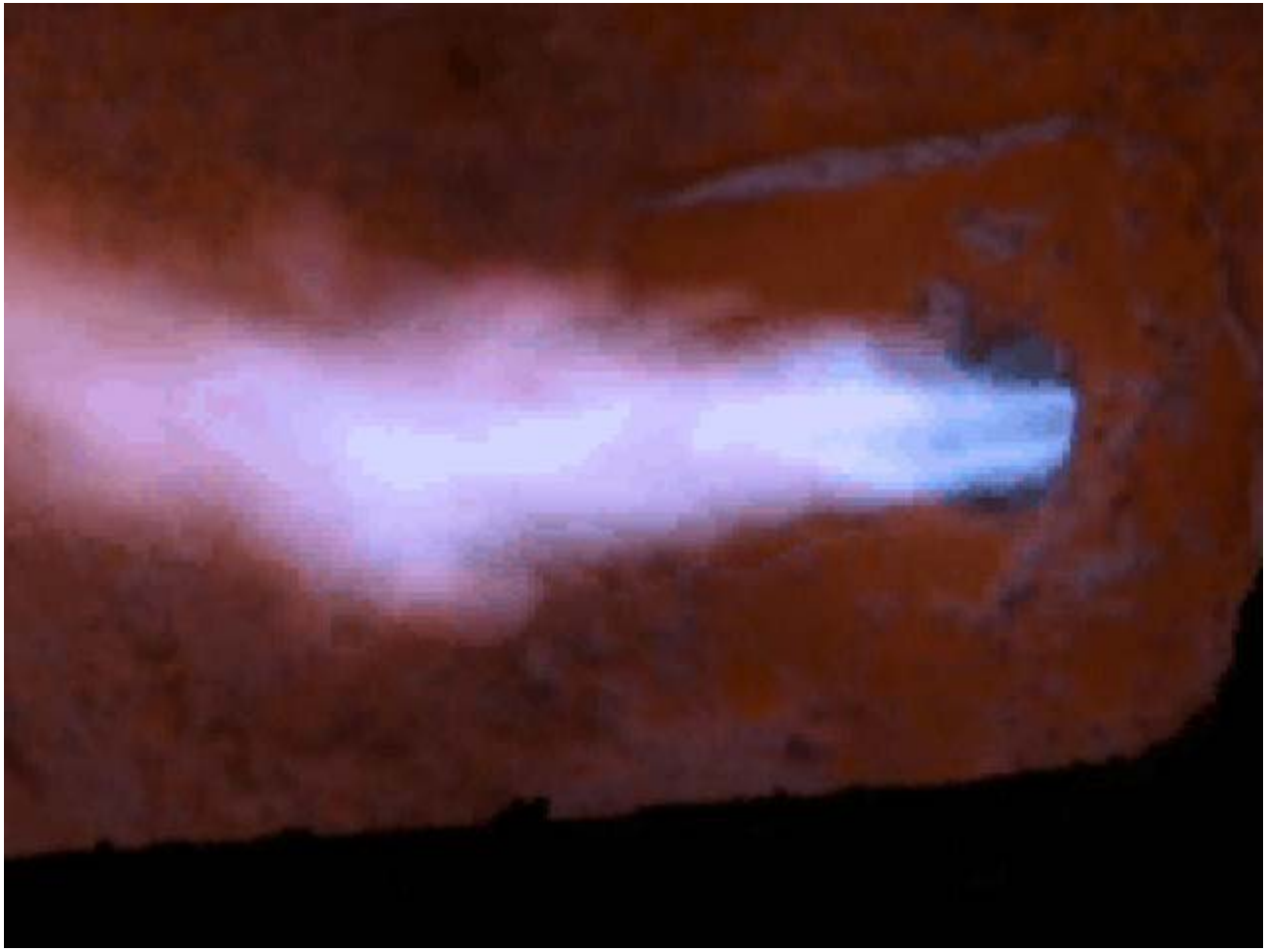
Jupiter Oxygen Corporation　JOC公司

- Technology Development
- 技术发展

- Patents and Licensing
- 专利权和专利许可证

- Consulting Services
- 咨询服务

HIGH TEMPERATURE OXY-COMBUSTION FLAME 高温富氧燃烧火焰



OXY-COMBUSTION ELIMINATES NITROGEN FROM AIR　富氧燃烧将氮从空气中排除

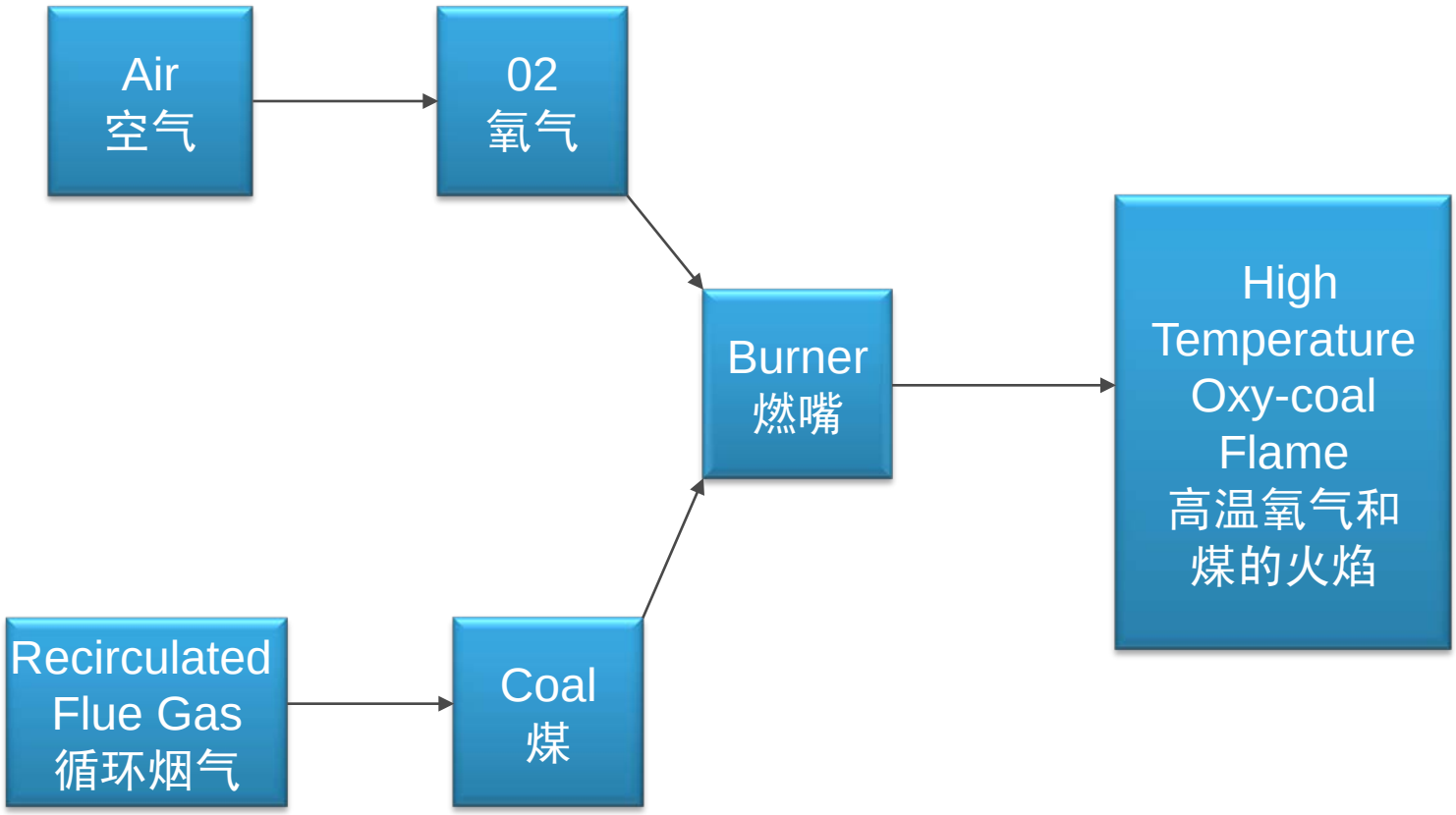
- Oxy-combustion uses oxygen instead of air
- 富氧燃烧使用氧气而非空气

- Ultra-low NOx at combustion
- 燃烧时只有超低的氮氧化物

- No need to separate nitrogen from CO2 for carbon capture
- 无需从捕捉到的CO2中分离氮气

- Nitrogen produced for ECBM
- 排放出的氮气可以用于提高煤层气的产量

JOC OXY-COMBUSTION
JOC富氧燃烧



FLAME TEMPERATURE MATTERS
火焰温度很重要

- Jupiter has unique high flame temperature oxy-combustion
- Jupiter拥有独一无二的高火焰温度富氧燃烧
- Higher flame temperature – 2760 C range
- 高火焰温度达到-2760摄氏度
- Control heat transfer 控制热传递
- Process temperatures = air firing
- Material temperatures = air firing
- 进程温度=周围空气燃烧
- 材料温度=周围空气的燃烧
- Greater radiant heat transfer
- 更多的辐射热传导
- Saves fuel 节省燃料

LOWER CAPITAL AND OPERATING COSTS
低的资本投入和运营成本

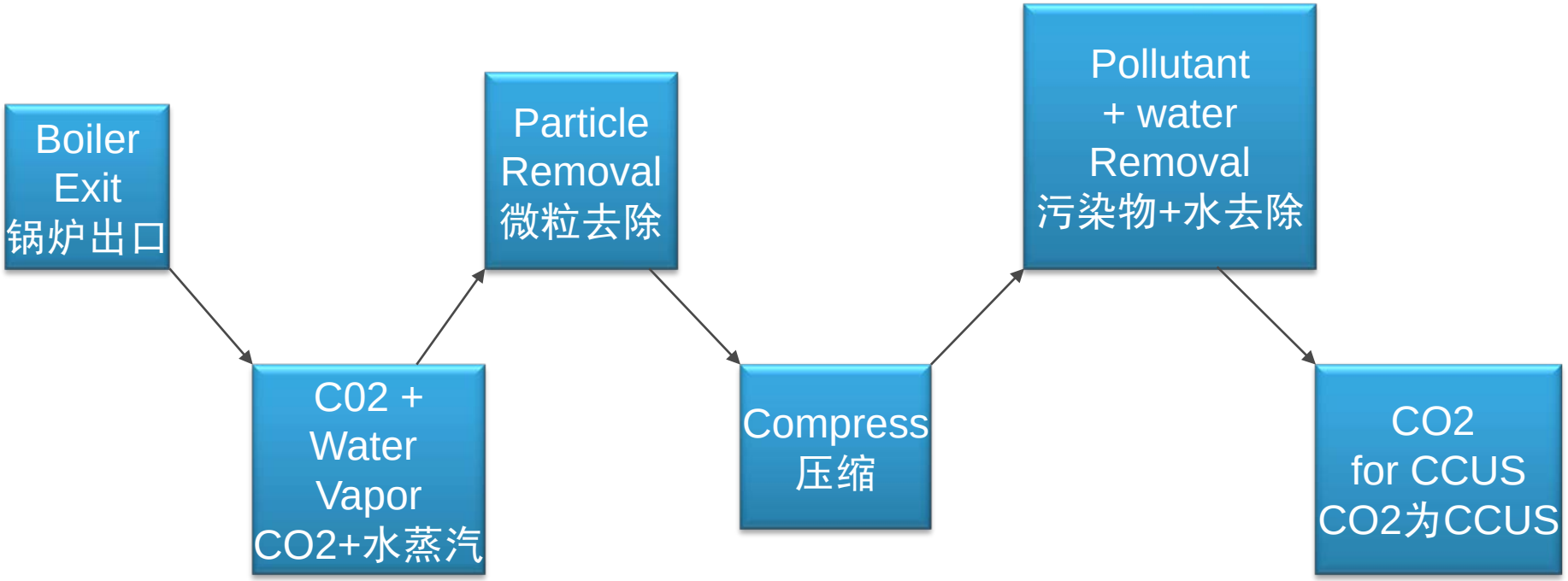
- Fuel savings with Jupiter's process
- 使用Jupiter的工艺节省燃料
  - -- Lower fuel costs
  - – Less fuel = less oxygen needed
  - – Less fuel = less carbon dioxide created
  - – 燃料成本低
  - – 更少的燃料=更少的氧气需求
  - – 更少的燃料=产生更少的二氧化碳

Purer carbon dioxide at the boiler exit

- 从锅炉排出的二氧化碳纯度更高
- Lowers carbon capture costs
- 更低的碳捕捉成本

High flame temperature oxy-coal boiler flames

INTEGRATED POLLUTION REMOVAL （IPR)综合污染物去除



INTEGRATED POLLUTANT REMOVAL
综合污染物去除

DOE-NETL Carbon Capture System

美国能源部-国家能源技术实验室 碳捕捉系统

Compresses and changes 压缩和变化

- Flue gas temperature —烟气温度
- Pressure —压力

- Heat exchangers remove water and S0x
- 换热器除水和SOx
- Filters remove Hg and particulate 过滤器滤除贡和微粒
- 95-100% CO2 capture 95%-100%的CO2被捕捉
- Transport ready carbon capture 碳捕获运输准备就绪
- Jupiter's technology enables combined Jupiter-IPR systems to be:
- Jupiter-IPR技术的结合能使系统更
  - Economical -经济
  - Efficient -高效

ADDITIONAL SAVINGS
额外的节省

- Heat Recovery – Compressors
- 热量回收-压缩机

  -Oxygen plant - 制氧厂

  – IPR -污染物综合治理

- Water Recovery – IPR
- 水回收—IPR
  - Exceeds boiler feed water requirements
  - 超过锅炉给水要求

THE PATH TO CARBON CAPTURE
碳捕获的路径

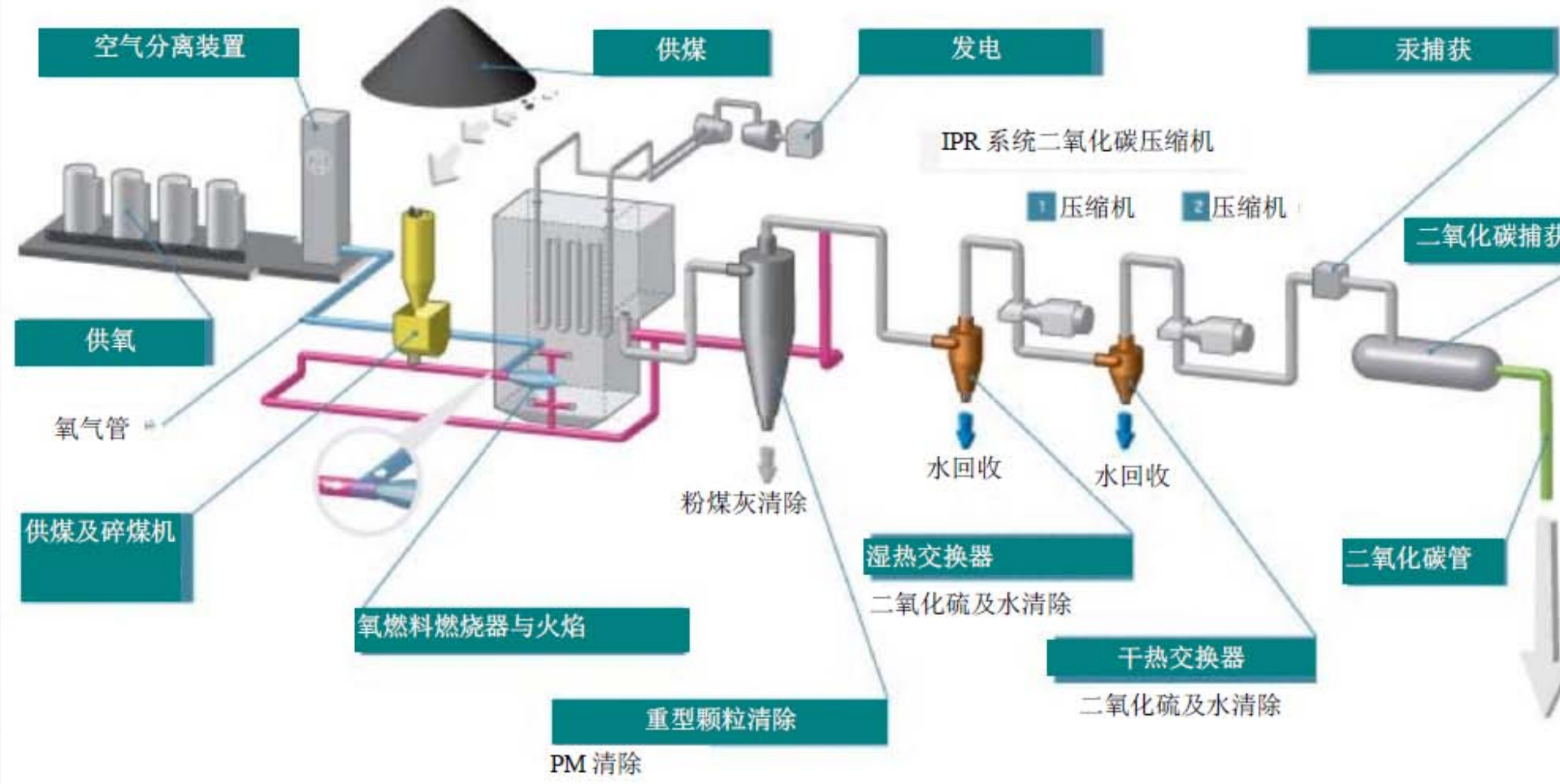
- Jupiter Oxygen high flame temperature heat transfer using oxy-combustion:

使用富氧燃烧进行高温热传导的Jupiter Oxygen的技术：

  - The best approach to carbon capture
  - 是进行碳捕捉的最佳方式

  - For both retrofits and new build power plants.
  - 适用于改造和新建的电厂

  - CCUS：CO2 from JOC technologies
  - CCUS:二氧化碳可以从JOC的技术中得到


空气分离装置
供煤
发电
汞捕获
IPR 系统二氧化碳压缩机
1 压缩机
2 压缩机
二氧化碳捕获
供氧
氧气管
水回收
水回收
粉煤灰清除
供煤及碎煤机
湿热交换器
二氧化硫及水清除
二氧化碳管
氧燃料燃烧器与火焰
干热交换器
二氧化硫及水清除
重型颗粒清除
PM 清除
烟气循环
潜热回收
氧气管
水回收
二氧化碳管
二氧化碳地下存储及使用
特殊的地质构造
强化氧气/天然气回收

STRATEGIC ALLIANCE 战略联盟

- May 9, 2011
- ２０１１年５月９日

- Xinjiang Guanghui New Energy and JOC
- 新疆广汇新能源公司与JOC公司
- Strategic Alliance for JOC high flame temperature oxy-combustion and carbon capture technologies in China
- 战略联盟为JOC公司在中国推广高火焰富氧燃烧技术和碳捕捉技术

JOC-GUANGHUI SIGNING CEREMONY

CCUS Project in North West of China
CCUS项目在中国西北地区

JOC-GUANGHUI CO2 CAPTURE PROJECT
JOC-广汇CO2捕集项目

- Retrofit 170 MWe power plant with high flame temperature Oxy-combustion with CO2 capture system
- 改建一台170MWe的电厂，将高火焰温度富氧燃烧技术和CO2的捕捉系统应用于改建的电厂

- Retrofit carbinol plant with CO2 capture system
- 改建甲醇煤化工厂，将CO2捕集系统对接

- The project will capture more than 95% of the CO2 produced, resulting in approximately 2,400,000 tons of CO2 which will be 95% pure for CCUS.
- 此项目将捕集到产生的95%的CO2，结果是捕集大约240万吨的纯度在95%以上的CO2用于CCUS

- SNC Lavalin: Leads engineering SNC 兰万灵：工程指挥

广汇能源
Guanghui Energy

奉献能源　　创造和谐

广汇介绍

二〇一一年六月

CCUS：EOR for China Oil Fields
CCUS: EOR技术在中国油田

- CO2 is effective for Enhanced Oil Recovery (EOR)
- CO2是有效的驱油原料
- The big oil fields found mainly in the northeast, northwest and Unit 2 East China.
- 中国较大的油田主要集中在东北，西北和华东地区

- Xinjiang Province has the excellent geography status to implement the economic benefits of EOR through CO2 utilization
- 新疆是最具地理优势的使用CO2运用于EOR，从而实现经济效益的地区

CCUS:　Enhanced Coal Bed Methane Recovery
CCUS：提高煤层气的产量

- Coal bed methane (CBM) utilization is important to solve the lack of sufficient methane recovery. China is the biggest coal production and consumption country.
- 煤层气的使用是一个重要的解决能源缺乏和低效使用的途径。中国是最大的煤炭生产和消费国。
- CBM is a new clean energy for China.
- 煤层气对中国是一个新的清洁能源
- CO2 and Nitrogen used for ECBM
- CO2和氮气可以用于ECBM

Geographic Distribution Of Coal Mines Xin Jiang

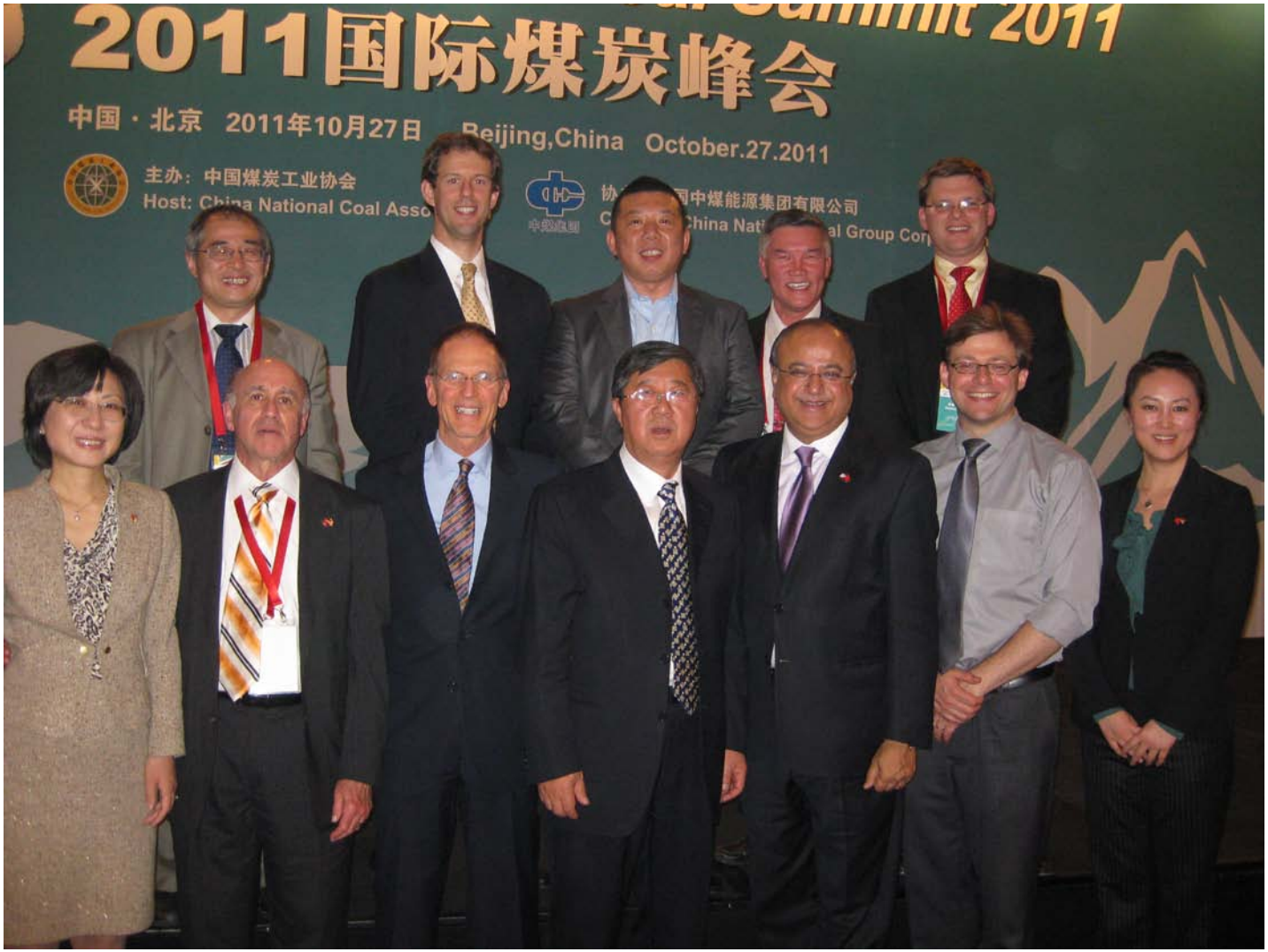
- Xin Jiang

HARMONIOUS DEVELOPMENT
和谐发展

Advancement
环境提升

2d from left: Mr. Schoenfield, Jupiter Right: Ms. Chen, Jupiter
Center: Mr. Wang, China Coal Association
3d from right: US Assist. Secretary of Commerce Mr. Kumar

- Trade Mission 2011



For the further information, contact:
更多的信息，请联系：

Catherine Chen Jing

Catherine 陈静

Tel：-86-21 6062 7388

Email: catherinechen@jupiteroxygen.com

Director of Development, China市场开发总监，中国

Jupiter Oxygen Corporation Shanghai Representative Office
美国朱比特氧气公司驻上海代表处

Address:8th Floor, IFC, No.8 Century Avenue, Shanghai ,China

地址：中国上海国际金融中心8楼